

REMARKS

Claims 1, 3-6 and 13-27 are all the claims presently being examined in the application. Claims 7-12 are hereby withdrawn from prosecution pursuant to the restriction requirement and canceled without prejudice or disclaimer. Claim 2 has also been canceled without prejudice or disclaimer. New claims 13-27 have been added to more completely claim the invention. Claims 1 and 3-6 have been amended to more particularly define the claimed invention.

It is noted that the amendments are made only to more particularly define the invention and not for distinguishing the invention over the prior art, for narrowing the scope of the claims, or for any reason related to a statutory requirement for patentability.

It is further noted that, notwithstanding any claim amendments made herein, Applicant's intent is to encompass equivalents of all claim elements, even if amended herein or later during prosecution.

Claims 1, 4, 5 and 6 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Gunten et al. (U.S. Patent No. 6,140,575), Errichiello (U.S. Patent No. 5,559,677), or Sowash (U.S. Patent No. 4,395,609). Claims 1 - 6 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Gunten et al., Errichiello, or Sowash.

These rejections are respectfully traversed in view of the following discussion.

I. RESTRICTION REQUIREMENT

In response to the Examiner's restriction requirement, Applicant hereby elects the invention of Group I directed to a heat resistant insulating film as defined by claims 1-6 with traverse in accordance with the provisional election made by telephone on December 15,

2004. Applicant reserves the opportunity to file a Divisional Application for the non-elected invention later.

II. THE CLAIMED INVENTION

Applicant's invention, as disclosed and claimed in claim 1, is directed to a heat-resistant insulating film. The heat-resistant film includes a film comprising a pattern profile corresponding to a structure with geometries including a convex or concave portion, the pattern profile being formed by three-dimensional forming for fitting onto the structure, wherein a material of the film comprises a polyimide.

Another aspect of the claimed invention, as recited in new claim 16, is directed to a heat-resistant insulating film comprising a pattern profile corresponding to a structure with geometries including a convex or concave portion, the pattern profile being formed by three-dimensional forming for fitting onto the structure, wherein the pattern profile comprises an uneven profile having a ratio of a depth to an opening width less than or equal to two.

In yet another aspect of the invention, as recited in new claim 25, a device for insulating a surface having an uneven profile is presented which comprises an insulating film formed to substantially correspond to the uneven profile, wherein the insulating film is fitted directly onto the surface to be insulated.

Conventional techniques for providing an insulating layer often use thermosetting resins, such as epoxy resins, as an insulating film. Newer methods employ heat-resistant resins. However, insulating layers formed of the heat-resistant resins generally involve complicated formation processes that result in high manufacturing costs and an overall lack of manufacturability. Additionally, when such insulating layers are used in applications

involving concave or convex surfaces, it generally requires the use of excessive insulating material thus increasing the weight of the insulated object. (Application at page 1, lines 13-27 and page 2, lines 1-8)

Thin layers of insulating films attached to a surface to be insulated are also considered. However, thin films of high functionality heat-resistant polyimide resins are not compliant with concave or convex surfaces due to the impossibility of fine attachment and resultant lack of stability. Moreover, when the surface to be insulated has a complicated profile, several sheets of insulating film are needed further complicating attachment. (Application at page 2, lines 9-18)

The invention recited in claim 1, on the other hand, provides a heat-resistant insulating film comprised of a heat-resistant polyimide resin and a pattern profile corresponding to the structure to be insulated. The pattern profile is formed by three-dimensional forming enabling the film to comport to surfaces with geometries including convex or concave portions. The polyimide provides for a high functionality and lightweight heat-resistant film, and the pattern profile enables easy mounting for improved manufacturability and reduced manufacturing costs as well as stability after mounting.

Additionally, as recited in new claim 16, the invention provides a pattern profile including an uneven profile having a ratio of a depth to an opening width less than or equal to two. This feature enables the formation of the uneven profile even for heat-resistant films having high functionality but with low formability.

Furthermore, the invention, as recited in new claim 25, provides a device for insulating a surface having an uneven profile comprising an insulating film formed to substantially correspond to the uneven profile, wherein the insulating film is fitted directly

onto the surface to be insulated. The insulating film provides for a high functionality and lightweight insulating layer which enables easy mounting by mounting directly onto the surface allowing for improved manufacturability and reduced manufacturing costs as well as stability after mounting.

III. THE PRIOR ART REJECTIONS

A. The Gunten et al. Reference

The Examiner alleges that the claimed invention is anticipated by the Gunten et al. reference and/or rendered obvious by Gunten et al. However, Applicant respectfully submits that the reference does not teach or suggest each and every element of the claimed invention.

Gunten et al. relates to improvements in electromagnetic shielding and specifically to a shielded electronic circuit assembly. (Gunten et al. at column 1, lines 6-8) In particular, Gunten et al. discloses a shielded assembly including an electromagnetic isolation shield enclosure formed of a shielding material, wherein the shielding material is comprised of an insulating polymer or plastic embedded with a conductive material in the form of a mesh or coupled fiber network. The enclosure is molded or shaped to contain a circuit assembly while leaving an insulating gap between the enclosure and the assembly. (Gunten et al. at column 3, lines 6-16 and lines 23-26)

However, Gunten et al. fails to teach or suggest “*a heat-resistant insulating film comprising a film comprising a pattern profile corresponding to a structure with geometries including a convex or concave portion, the pattern profile being formed by three-dimensional forming for fitting onto the structure, wherein a material of the film comprises a polyimide,” as recited in claim 1.*

Indeed, the Examiner has conceded in the present Office Action that the reference is silent as to the material of the enclosure being a polyimide. The Examiner asserts that one of skill in the art would choose a desired material in view of the prior art teachings since such variables are a matter of design choice.

However, as noted above, thin films of high functionality polyimide resins are not compliant with concave or convex surfaces due to the impossibility of fine attachment and resultant lack of stability. In fact, nowhere does Gunten et al. even recognize the problems with forming and attaching films of high functionality heat-resistant resins, such as polyimide, which is a problem which the claimed invention is intended to address.

Indeed, the only materials disclosed for the enclosure in Gunten et al. are polyvinylchloride (PVC) and polyester. The reference makes no mention of polyimide, and in fact, teaches away from such a non-compliant resin by indicating that the shielding material should be easily produced in complex shapes and be molded or shaped by well-known methods. (Gunten et al. at column 3, lines 8-11 and lines 26-30) Clearly, this feature is not taught or suggested by the cited reference.

Gunten et al. also fails to teach or suggest “*a heat-resistant insulating film comprising a pattern profile corresponding to a structure with geometries including a convex or concave portion, the pattern profile being formed by three-dimensional forming for fitting onto the structure, wherein the pattern profile comprises an uneven profile having a ratio of a depth to an opening width less than or equal to two,” as recited in new claim 16.*

Indeed, the Examiner has conceded in the present Office Action that the reference fails to teach any ratio for the uneven profile. The Examiner asserts that one of skill in the art would choose a desired profile in view of the prior art teachings since such variables are a

matter of design choice.

However, the reference does not address the specifics of the geometry of the enclosure with respect to the material used and certainly does not suggest that a ratio of the depth to the opening width being less than or equal to two enables the formation of an uneven pattern profile for high functionality heat-resistant films having less formability. (See Application at page 5, lines 13-17) The formation of the uneven pattern profile allows the film to be readily mounted on the structure to be insulated, and enables stable attachment even on such uneven surface profiles. (Application at page 5, lines 10-13) Clearly, this feature is not taught or suggested by the cited reference.

Additionally, Gunten et al. fails to disclose *“a device for insulating a surface having an uneven profile is presented which comprises an insulating film formed to substantially correspond to the uneven profile, wherein the insulating film is fitted directly onto the surface to be insulated,”* as recited in new claim 25.

Specifically, Gunten et al. does not teach or suggest that the insulating film may be fitted directly onto the surface to be insulated. In fact, Gunten et al. discloses an insulating gap between the enclosure and the surface of the circuit assembly. The reference actually specifically teaches away from the enclosure being in direct contact with the circuit assembly indicating that the insulating gap should be just large enough to prevent the enclosure from short-circuiting the circuit assembly. (Gunten et al. at column 5, lines 1-9) Gunten et al. further indicates that a typical gap is 5 mm, but larger gaps may be used depending on the application. (Gunten et al. at column 5, lines 9-13) This feature is clearly not taught or suggested by the cited reference.

In light of the above, Applicant submits that the Gunten et al. reference does not teach

or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection.

B. The Errichiello Reference

The Examiner alleges that the Errichiello reference anticipates the claimed invention and/or renders obvious the claimed invention. However, Applicant respectfully submits that the reference does not teach or suggest each and every element of the claimed invention.

Errichiello relates to a molded housing for electronic devices. (Errichiello at column 1, lines 16-17) In particular, Errichiello appears to disclose a method of forming a device by selectively thermal spraying a metallic conductive material onto a housing for a desired ground shield. (Errichiello at column 2, lines 40-43) The housing provides the device with an external physical frame into which circuit assemblies may be enclosed.

However, Errichiello fails to teach or disclose “*a heat-resistant insulating film comprising a film comprising a pattern profile corresponding to a structure with geometries including a convex or concave portion, the pattern profile being formed by three-dimensional forming for fitting onto the structure, wherein the material of the film comprises a polyimide,*” as claim 1 recites.

As above, the Examiner has conceded in the present Office Action that the reference is silent as to the material of the enclosure being a polyimide. The Examiner asserts that one of skill in the art would choose a desired material in view of the prior art teachings since such variables are a matter of design choice.

However, as noted above, thin films of high functionality polyimide resins are not compliant with concave or convex surfaces due to the impossibility of fine attachment and resultant lack of stability. In fact, nowhere does Errichiello even recognize the problems

with forming and attaching films of high functionality heat-resistant resins, such as polyimide, which is a problem that the claimed invention is intended to address.

Furthermore, Errichiello only discloses that the housing can be formed by a plastic or resin. (Errichiello at column 1, lines 32-34 and column 3, lines 27-29) The reference makes no mention of the housing having any thermally insulating effects, or more pointedly, the benefit or desirability of the material of the housing being heat-resistant. Errichiello actually makes no mention of polyimide or a film thereof having a pattern profile corresponding to the structure to be insulated. In fact, Errichiello makes no reference to a heat-resistant film of any sort. Clearly, this feature is not taught or suggested by the cited reference.

Additionally, Errichiello fails to teach or disclose *“a heat-resistant insulating film comprising a pattern profile corresponding to a structure with geometries including a convex or concave portion, the pattern profile being formed by three-dimensional forming for fitting onto the structure, wherein the pattern profile comprises an uneven profile having a ratio of a depth to an opening width less than or equal to two,”* as recited in new claim 16.

In fact, the Examiner has conceded in the present Office Action that Errichiello fails to teach any ratio for the uneven profile. The Examiner asserts that one of skill in the art would choose a desired profile in view of the prior art teachings since such variables are a matter of design choice.

However, the reference does not address the geometry of the enclosure with respect to the material used and certainly does not teach or suggest that a ratio of the depth to the opening width being less than or equal to two enables the formation of an uneven pattern profile for high functionality heat-resistant films having low formability. (See Application at page 5, lines 13-17) The formation of the uneven pattern profile allows the film to be readily

mounted on the structure to be insulated, and enables stable attachment even on such uneven surface profiles. (Application at page 5, lines 10-13) Furthermore, Errichiello makes no reference to a heat-resistant film of any sort. Clearly, this feature is not taught or suggested by Errichiello.

Errichiello also fails to disclose “a device for insulating a surface having an uneven profile comprising an insulating film formed to substantially correspond to the uneven profile, wherein the insulating film is fitted directly onto the surface to be insulated,” as recited in new claim 25.

As noted above, Errichiello makes no reference to a heat-resistant film of any sort. Moreover, the reference makes no mention of the housing having any thermally insulating effects, or more pointedly, the benefit or desirability of the material of the housing being heat-resistant. In particular, Errichiello certainly does not teach or suggest that an insulating film having an uneven profile that may be fitted directly onto a surface to be insulated. Clearly, these features are not taught or suggested by Errichiello.

In light of the above, Applicant submits that the Errichiello reference does not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection.

C. The Sowash Reference

The Examiner alleges that the Sowash reference anticipates and/or renders obvious the claimed invention. However, Applicant respectfully submits that the reference does not teach or suggest each and every element of the claimed invention.

Sowash relates to a cam operated dual switch assembly and particularly to such an

assembly which provides an alternating sequence of switch actuation upon actuator reciprocation. (Sowash at column 1, lines 4-7)

However, Sowash fails to teach or disclose “*a heat-resistant insulating film comprising a film comprising a pattern profile corresponding to a structure with geometries including a convex or concave portion, the pattern profile being formed by three-dimensional forming for fitting onto the structure, wherein the material of the film comprises a polyimide,*” as claim 1 recites.

As above, the Examiner has conceded in the present Office Action that the reference is silent as to the material of the enclosure being a polyimide. The Examiner asserts that one of skill in the art would choose a desired material in view of the prior art teachings since such variables are a matter of design choice.

However, as noted above, thin films of high functionality polyimide resins are not compliant with concave or convex surfaces due to the impossibility of fine attachment and resultant lack of stability. In fact, nowhere does Sowash even recognize the problems with forming and attaching films of high functionality heat-resistant resins, such as polyimide, which is a problem that the claimed invention is intended to address.

Furthermore, Sowash merely discloses a molded housing formed of plastic. (Errichiello at column 1, lines 55-56) The reference makes no mention of the housing having any thermally insulating effects, or more pointedly, the benefit or desirability of the material of the housing being heat-resistant. Sowash actually makes no mention of polyimide or a film thereof having a pattern profile corresponding to the structure to be insulated. In fact, Sowash teach or suggest a heat-resistant film of any sort. Clearly, this feature is not taught or suggested by this reference.

Additionally, Sowash fails to teach or disclose “*a heat-resistant insulating film comprising a pattern profile corresponding to a structure with geometries including a convex or concave portion, the pattern profile being formed by three-dimensional forming for fitting onto the structure, wherein the pattern profile comprises an uneven profile having a ratio of a depth to an opening width less than or equal to two,*” as recited in new claim 16.

The Examiner has conceded in the present Office Action that the references fail to teach any ratio for the uneven profile. The Examiner asserts that one of skill in the art would choose a desired profile in view of the prior art teachings since such variables are a matter of design choice.

However, Sowash does not address the geometry of the enclosure with respect to the material used and certainly does not teach or suggest that a ratio of the depth to the opening width being less than or equal to two enables the formation of an uneven pattern profile for high functionality heat-resistant films having low formability. (See Application at page 5, lines 13-17) The formation of the uneven pattern profile allows the film to be readily mounted on the structure to be insulated, and enables stable attachment even on such uneven surface profiles. (Application at page 5, lines 10-13) Moreover, Sowash makes no reference to a heat-resistant film of any sort. Clearly, this feature is not taught or suggested by Sowash.

Additionally, Sowash fails to disclose “*a device for insulating a surface having an uneven profile is presented which comprises an insulating film formed to substantially correspond to the uneven profile, wherein the insulating film is fitted directly onto the surface to be insulated,*” as recited in new claim 25.

As noted previously, Sowash makes no reference to a heat-resistant film of any sort. Moreover, the reference makes no mention of the housing having any thermally insulating

effects, or more pointedly, the benefit or desirability of the material of the housing being heat-resistant. In particular, Sowash certainly does not teach or suggest that an insulating film having an uneven profile that may be fitted directly onto a surface to be insulated. These features are clearly not taught or suggested by Sowash.

In light of the above, Applicant submits that the Sowash reference does not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection.

Moreover, neither Gunten et al., nor Errichiello, nor Sowash, nor any combination thereof, teaches or suggests “*a heat-resistant insulating film comprising a film comprising a pattern profile corresponding to a structure with geometries including a convex or concave portion, the pattern profile being formed by three-dimensional forming for fitting onto the structure, wherein the material of the film comprises a polyimide,*” as recited in claim 1, or “*a heat-resistant insulating film comprising a pattern profile corresponding to a structure with geometries including a convex or concave portion, the pattern profile being formed by three-dimensional forming for fitting onto the structure, wherein the pattern profile comprises an uneven profile having a ratio of a depth to an opening width less than or equal to two,*” as recited in claim 16, or “*a device for insulating a surface having an uneven profile is presented which comprises an insulating film formed to substantially correspond to the uneven profile, wherein the insulating film is fitted directly onto the surface to be insulated,*” as recited in claim 25. As noted above, these features, separately and collectively, help to provide for a high functionality and lightweight heat-resistant film that enables easy mounting for improved manufacturability and reduced manufacturing costs, as well as stability after mounting.

Applicant submits that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection.

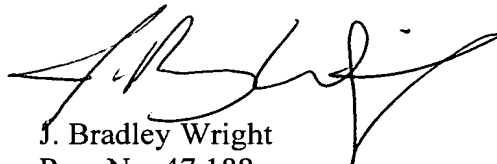
IV. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicant submits that claims 1, 3-6 and 13-27, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,


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